

CLAIMS

1. A method for routing optical data comprising the steps of:
transmitting optical addressing data to a first network element having routing
5 capabilities;
assigning an appropriate optical link connecting said first network element with
a second network element where the assignment is based on the optical
addressing data; and
transmitting the optical data via the assigned optical link.
- 10 2. In a telecommunication system, a method for routing optical data signals
using one or more optical addressing links for carrying optical addressing
signals, wherein a combination of said optical addressing signals provides
addressing information required for establishing an address for routing the
15 optical data signals and wherein said optical data signals are transmitted via an
optical data link.
3. In a telecommunication system, a method for routing optical data signals,
which method comprises:
- 20 a) generating first optical addressing signals by converting signals identifying a
destination address into corresponding optical addressing signals;
b) transmitting said optical addressing signals over one or more optical
addressing links to a first router; and
c) concurrently or subsequently, transmitting said optical data signals to said
25 first router via an optical data link.
4. A method according to claim 3. further comprising the steps of:

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- d) generating second optical addressing signals associated with the next section of a transmission path extending from said first router towards said destination address;
- e) transmitting the second optical addressing signals over one or more optical addressing links extending between said first router and a second router;
- f) concurrently or subsequently, transmitting said optical data signals to said second router via an optical data link extending between said first router and said second router; and
- g) repeating steps (d) to (f) until said optical data signals are transmitted to said destination address via subsequent routers located along a transmission path extending towards said destination address.

5. A method according to any one of the preceding claims, wherein at least one of the optical addressing links and/or the optical data link is an optic fiber.

6. A method according to any one of claims 2 to 4, wherein the information extracted from at least one of the optical addressing signals transmitted at one of two binary illumination states.

7. A method according to any one of claims 2 to 4, wherein at least one of the optical addressing signals is transmitted at a certain illumination level whereas at least one other optical addressing signal is presented by absence of illumination.

8. A method according to any one of claims 2 to 4, wherein at least two of the optical addressing signals are transmitted each at substantially the same wavelength and at a different illumination intensity and wherein each of the illumination intensities corresponds to a different addressing information.

9. A method according to any one of claims 2 to 4, wherein at least two of the optical addressing signals are transmitted each at substantially the same intensity and at a different wavelength, and wherein each of the different wavelengths corresponds to a different addressing information.

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10. A method according to any one of claim 6 to 8, wherein an optical address is derived from a combination of at least two optical addressing signals each transmitted at a different wavelength and at a different intensity from the other.

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11. A method according to any one of the preceding claims, wherein the transmission of at least one of the optical data signals is delayed until the following steps are performed:

- a) decoding said optical addressing signals;
- 15 b) deriving addressing information from the decoded optical addressing signals; and
- c) if required, generating another, or using said, optical routing address for further routing of said optical data signals.

20 12. A method according to claim 11, wherein the transmission of said at least one of the optical data signals is delayed by allowing said at least one of the optical data signals to pass through an optic fiber of a length corresponding to a desired delay in the transmission.

25 13. In a telecommunication system, a method for routing optical data signals, which method comprises.

- a) generating first optical addressing signals by converting the signals identifying a destination address into corresponding optical addressing signals;

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- b) assigning optical addressing links towards said destination address;
- c) establishing a data transmission path between a transmission source transmitting said optical addressing signals over one or more and a destination for the transmission of the optical data signals;
- 5 d) transmitting to said transmission source an indication that said optical data signals can be forwarded towards their destination;
- e) receiving said indication at said transmission source; and
- f) transmitting said optical data signals towards said destination along said data transmission path.

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14. A method according to claim 13, wherein step (f) is delayed until step (e) is completed.

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15. A method according to claim 13, wherein the indication is an optical indication signal

16. A method according to claim 15, wherein the optical indication signal is transmitted to the transmission source via the data transmission path.

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17. A method according to claim 15, wherein the indication is an electric indication signal.

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18. Apparatus for routing optical data signals using one or more optical addressing links for carrying optical addressing signals, the combination of which provides addressing information required for establishing an address for routing the optical data signals that are transmitted via an optical data link.

19. Apparatus for routing optical data signals, said apparatus comprises:

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- a) means for generating first optical addressing signals by converting signals identifying a destination address into corresponding optical addressing signals;
- b) means for transmitting said optical addressing signals over one or more optical addressing links to a first router; and
- 5 c) means for transmitting said optical data signals to said first router via an optical data link.

20. Apparatus according to any one of claims 18 to 19, comprising at least one of the optical addressing links and/or the optical data link which is an optic fiber.

21. Apparatus according to any one of claims 18 to 20, in which at least one of the optical addressing signals is transmitted by using one of two binary illumination states.

22. Apparatus according to one of claims 18 to 20, in which at least one of the optical addressing signal is transmitted at a certain illumination level and at least another optical addressing signal is presented by absence of illumination.

23. Apparatus according to any one of claims 18 to 20, in which at least two of the optical addressing signals are transmitted at substantially similar wavelength and at a different illumination intensity, and each of the illumination intensities corresponds to a different addressing information.

24. Apparatus to any one of claims 18 to 20, wherein at least two of the optical addressing signals are transmitted at a different wavelength, and each of the different wavelengths corresponds to a different addressing information.

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25 Apparatus according to Claim 24, wherein said at least two of the optical addressing signals are transmitted at substantially similar intensity

26. Apparatus according to any one of claim 18 to 20, in which at least two
5 of the optical addressing signals are transmitted each at a wavelength and intensity that are different from the wavelength and intensity of the other one of said at least two of the optical addressing signals.

27. Apparatus according to any one of claims 18 to 26, further comprising:

- 10 a) means for delaying optical data signals;
b) means for decoding said optical addressing data;
c) means for deriving addressing information from the decoded optical addressing signals; and
d) means for generating optical routing address for further routing of optical
15 data signals.

28. Apparatus according to claim 27, comprising an optic fiber for delaying
the transmission of at least one of the optical data signals and means for
directing said at least one of the optical data signals to pass through said optic
20 fiber.

29. Apparatus for routing optical data signals, comprising:

- a) circuitry for converting received optical addressing signals into routing
signals;
25 b) a memory for storing predetermined and/or updated routing signals;
c) circuitry for comparing the routing signals with addressing data stored in the
memory; and

d) circuitry for directing the incoming optical data signals to the corresponding outgoing optical data link by controlling the optical connection between incoming and outgoing optical paths according to the results of the comparison.

5 30. A telecommunication system comprising one or more optical addressing links for carrying a combination of optical addressing signals to the router, the combination provides addressing information required for establishing an address for routing the optical data signals.

10 31. A telecommunication system comprising:
a) means for generating first optical addressing signals by converting signals identifying a destination address into corresponding optical addressing signals;
b) means for transmitting said optical addressing signals over one or more optical addressing links towards said destination address;
15 c) a data transmission path extending between a transmission source and a destination for the transmission of the optical data signals;
d) means for transmitting to said transmission source an indication that said optical data signals can be forwarded towards their destination;
e) means for receiving said indication ; and
20 f) means for transmitting said optical data signals responsive to receiving said indication, towards said destination along said data transmission path.

32. A system according to claim 31, wherein the indication is an optical indication signal.

25 33. A system according to claim 32, in which the optical indication signal is transmitted to the transmission source via the data transmission path.

34. A system according to claim 31, in which the indication is an electric indication signal.

35. Apparatus for generating optical addressing signals for routing optical data signals adapted to be transmitted via an optical data link, comprising:

- a) one or more controllable light sources; and
- b) a control circuitry for causing each of said controllable light sources to emit light, of a wavelength and/or of illumination intensity, according to an electrical addressing signal that corresponds to a specific address element.

36. Apparatus according to claim 35, further comprising:

- c) one or more optical links, each of which is associated with said one or more controllable light sources, for optically transmitting one or more optical address signals in parallel with, or prior to, the routed optical data signals.

37. Apparatus for transmitting optical data signals, comprising:

- a) means for generating optical addressing signals by converting signals identifying a destination address into corresponding optical addressing signals;
- b) means for transmitting said optical addressing signals over one or more optical addressing links towards said destination address; and
- c) means for transmitting said optical data signals towards said destination.

38. An apparatus according to Claim 37, further comprising means for receiving an indication that said optical data signals can be forwarded towards their destination, wherein said means for transmitting said optical data signals is adapted to transmit the optical data signals towards said destination responsive to receiving said indication.

39. Apparatus for routing optical data signals, comprising:

- a) means for receiving optical addressing signals,
b) circuitry for converting received optical addressing signals into routing signals;
c) a memory for storing predetermined and/or updated routing signals;
5 d) circuitry for comparing the routing signals with addressing data stored in the memory; and
e) means for generating optical addressing signals corresponding to said optical data signals' destination address;
f) means for transmitting said optical addressing signals over one or more optical addressing links towards said destination address; and
10 g) circuitry for directing the incoming optical data signals to the corresponding outgoing optical data link by controlling the optical connection between incoming and outgoing optical paths according to the results of the comparison.
- 15 40. A telecommunication routing apparatus comprising:
a) means for receiving first optical addressing signals;
b) means for generating second optical addressing signals associated with the next section of a transmission path extending towards the destination address;
c) means for transmitting the second optical addressing signals over one or
20 more optical addressing links extending towards the destination address ;
d) means for receiving the optical data signals; and
e) means for transmitting the optical data signals received towards the destination address.
- 25 41. A method for routing optical data signals according to optically transmitted addressing signals, substantially as described and illustrated.
42. Apparatus for routing optical data signals according to optically transmitted addressing signals, substantially as described and illustrated.

43. A telecommunication system comprising routing optical data signals according to optically transmitted addressing signals, substantially as described and illustrated.

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